Effectiveness of Arbitration Activities on Physical and Biochemical Indices among Adolescent Girls with Anaemia in selected rural community, Madurai

Synopsis

Submitted for the award of

Degree of

DOCTOR OF PHILOSOPHY

IN

NURSING

SRI BALAJI VIDYAPEETH

(Deemed to be University of UGC Act 1956)

By

Mrs. S. ANNALAKSHMI M.Sc. NURSING

UIN NO: 1905002019

Under the Guidance of

Dr. SUJATHA. T

Professor & Head of the Department

Shri Sathya Sai College of Nursing

Sri Balaji Vidyapeeth University (DU)

Chennai Campus

TABLE OF CONTENTS

NO.	CONTENT	PAGE NO.
I	Introduction	1
	Aim	2
	Objectives	3
	Hypotheses	4
II	Review of Literature	6-7
III	Research Methodology	
	Research Approach and Design	9
	Research Variables	9
	Research Setting	9
	Population	9
	Sample, Sampling technique, and Criteria	10
	Tool for the data collection	10-11
	Pilot study	12
	Data Collection Procedure	12
	Ethical consideration	15
IV	Data Analysis & Interpretation	16-24
V	Results and Discussion	25-27
VI	Summary and Conclusion	28
	Limitations and Recommendations	29
	Implications	30
VII	References	31

LIST OF TABLES

S. NO.	DESCRIPTION	PAGE NO.
1.	Level of Body Mass Index between Experiment and Control group	17
2.	Level of Signs & Symptoms of Anaemia in Experiment and Control group	18
3.	Level of Hemoglobin in Experiment and Control group of adolescent girls	19
4.	Associative risk factors of Anaemia in Experimental and Control group of adolescent girls	20
5.	Relationship between the physical and biochemical indices among adolescent girls with Anaemia in experimental and control group	21
6.	Association of selected demographic variables with the mean difference level of physical and biochemical indices	22
7.	Relationship between the associative risk factors and the level of Anaemia in experimental and control group	23

LIST OF GRAPHS

S. NO.	DESCRIPTION	PAGE NO.
1.	Comparing the pretest, post-test - I and post-test-II Body Mass Index level	18
2.	Comparing the level of Signs & Symptoms in the experimental and control group during pretest, post-test-I, and post-test-II	19
3.	Comparing the mean level of Haemoglobin in the experimental and control group	20
4	Relationship between the Signs & Symptoms and the level of risk factors	23
5	Perceived level of satisfaction in the experimental group	24

LIST OF GRAPHS

S. NO.	DESCRIPTION	PAGE NO.
1.	Comparing the pretest, post-test - I and post-test-II Body Mass Index level	18
2.	Comparing the level of Signs & Symptoms in the experimental and control group during pretest, post-test-I, and post-test-II	19
3.	Comparing the mean level of Haemoglobin in the experimental and control group	20
4	Relationship between the Signs & Symptoms and the level of risk factors	23
5	Perceived level of satisfaction in the experimental group	24

LIST OF ANNEXURES

S. NO.	CONTENT
1.	Research Methodology exam pass certificate
2.	Research Methodology course completion certificate
3.	Institutional Ethical Clearance Certificate
4.	Published Papers/Research Visibility
5.	Certificate of oral Presentation

ABSTRACT

Anaemia is a serious public health problem. It is the second-commonest contributing factor to years lost by adolescents to disability and death. Targeting adolescent girls will allow a window of opportunity to correct their nutritional health and improve their obstetric outcomes.

OBJECTIVES: This study aimed to assess the physical and biochemical indices of the adolescent girls with Anaemia and to assess the effectiveness of arbitration activities on physical and biochemical indices among rural adolescent girls.

METHODS: A Quasi-experimental study conducted among the 170 rural adolescent girls on the effectiveness of arbitration activities on physical and biochemical indices among adolescent girls with anaemia at selected setting Madurai. Formal permission obtained from the authorities and participants of the study. Screening for anaemia was done by using digital hemoglobinometer to recruit the study samples. By using Non probability Purposive sampling technique 85 in experimental 85 in control were recruited as samples. Pretest was done by using Observation technique, self-devised check list and rating scale to assess the Body Mass Index, Signs and Symptoms of anaemia, associative risk factors of anaemia. Arbitration activities carried out to the experimental group by means of IEC on anaemia, Drumstick leaves soup for three months, Pamphlets on dietary resources to manage and prevent Anaemia, Nutritional Exhibition on healthy eating, dietary habits and practices. Post test was conducted at 3rd month and 6th month of intervention by using the same tools. Descriptive and Inferential statistics were used to analyse the collected data.

RESULT: There was a significant change in the Body mass index, Haemoglobin level, Signs & Symptoms and associative risk factors of Anaemia in the experimental group whereas there was no significant difference identified in the control group. Also 98% of the girls were very much satisfied with the arbitration activities. Wait list interventions were carried out to the control group girls after the post test.

CONCLUSION: This study concluded that there was a significant improvement in physical and biochemical indices in the experimental group after the arbitration activities. Arbitration activities are integrative comprehensive and holistic strategies to increase the Body mass index, Haemoglobin level, reducing the Signs & Symptoms and associative risk factors of Anaemia

CHAPTER I

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

"Healthy adolescent girls of today are the healthy mothers of tomorrow"

Anaemia is a serious global public health problem that particularly affects young children, menstruating adolescent girls & women, and pregnant and postpartum women. World Health Organization estimates that 30% of women 15–49 years of age worldwide are anaemic[1]. In 2019, global Anaemia prevalence was 29.9% (95% uncertainty interval (UI) 27.0%, 32.8%) in women of reproductive age, equivalent to over half a billion women aged 15-49 years. Prevalence was 29.6% (95% UI 26.6%, 32.5%) in non-pregnant women of reproductive age and 36.5% (95% UI 34.0%, 39.1%) in pregnant women. Number of women with Anaemia in reproductive age 15 to 49 in the year of 2021 was 141492. Women with Anaemia are more likely to experience fatigue and impaired physical capacity in their daily lives. Moderate and severe Anaemia are also risk factors for adverse maternal and perinatal outcomes.

Global trends in the prevalence of Anaemia among all women 15–49 years of age (SDG indicator 2.2.3) show no significant change from 31.2% (UI: 28.7–34.1) in 2000 to 29.9% (UI: 27.0–32.8) in 2019. With population growth, the total number of women aged 15–49 years affected increased from 493 million in 2000 to 571 million in 2019. While there was a slight decrease in Anaemia prevalence among pregnant women from 40.9% (UI: 38.7–43.1) in 2000 to 36.5% (UI: 34.0–39.1) in 2019, prevalence among non-pregnant women remained stagnant, at 30.7% (UI: 28.1–33.7) in 2000 and 29.6% (UI: 26.6–32.5) in 2019[1].

In India, the empowerment and education of adolescent girls are crucial for sustainable development and social justice, particularly in a society where patriarchal norms significantly influence the status and opportunities available to women and girls. Also in India, patriarchal norms create a challenging environment for adolescent girls, marked by gender disparities in education, health, and economic participation. These challenges are further highlighted by the World Economic Forum's Global Gender Gap Report 2023, which ranks India 127th out of 146 countries. Patriarchal

values also detrimentally impact girls' health, leading to nutritional deficiencies among many due to gender-based food distribution practices within families.

According to the NFHS-5 report, 59.1% of women aged 15-49 are anemic, a condition that significantly affects women's overall health and their capacity to lead productive lives[3].

Adolescent girls are central to breaking cycles of poverty, boosting economic growth, and fostering sustainable development. Their education and health are foundational to empowerment, enabling them to delay marriage and childbirth, raise healthier children, and secure higher incomes. This not only benefits the girls themselves but also has a substantial positive impact on their families and communities[3].

NOVELTY OF THE STUDY

Anaemia is a significant public health issue, particularly affecting women in India. However, little is known about the burden of Anaemia among adolescent women in India over time. The rise in Anaemia prevalence among adolescent women in India suggests the need for targeted interventions to mitigate the burden of Anaemia and enhance the overall health of this population.

The Anaemia Mukt Bharat (AMB) strategy, a key initiative to reduce Anaemia, was launched by the Government of India in 2018 for the vulnerable population including the adolescents with the key components of Prophylactic Iron and Folic Acid Supplementation, Periodic Deworming, Intensified year-round Behavior Change Communication Campaign, Testing and Treatment of Anaemia using digital methods (Digital Invasive Haemoglobinometer) in field settings, Mandatory provision of Iron and Folic Acid fortified foods in government-funded health programme, Intensifying awareness, screening and treatment of non-nutritional causes of Anaemia in endemic pockets. This study covered most of the aspects of that program to combat Anaemia among the future reproductive mothers.

1.2 AIM

To Identify the effectiveness of arbitration activities on arbitration activities on physical and biochemical indices among adolescent girls with Anaemia in the selected rural area.

1.3 OBJECTIVES

1.3.1 PRIMARY OBJECTIVES

- To determine the effectiveness of arbitration activities on physical and biochemical indices among adolescent girls with Anaemia between experimental and control group.
- To identify the relationship between the physical and biochemical indices among adolescent girls with Anaemia in experimental and control group.
- To find the association of selected demographic variables with the mean difference level of physical and biochemical indices among adolescent girls with Anaemia in experimental and control group.

1.3.2 SECONDARY OBJECTIVES

- To screen the adolescent girls for Anaemia
- To compare the associative risk factors of Anaemia in experimental and control group.
- To assess the relationship between the associative risk factors and the level of Anaemia in experimental and control group
- To assess the perceived satisfaction level of intervention for the study group

1.4. OPERATIONAL DEFINITION

- **Effectiveness:** Refers to the outcome of arbitration activities on physical indices using World Health Organization Body Mass Index value, check list of signs & symptoms and biochemical indices using Calibrated Hemoglobinometer which will be assessed after 3 months and 6 months of intervention.
- **Meaning of arbitration:** The process of solving an argument between people by helping them to agree to an acceptable solution.
- **Arbitration activities**: Refers to the structured group of activities devised by an investigator such as IEC (Information Education Communication) with Video-show, Drumstick leaves juice administration, Pamphlets and Nutritional Exhibition to improve the physical and biochemical indices among adolescent girls with Anaemia.
  - IEC: Conducted by the investigator by using Video show on causes, sign and symptoms, diagnosis, management and prevention of Anaemia
  - Drumstick leaves juice: – Hand-picked, cleaned and washed Drumstick leaves of 50gm boiled in 300 ml of water and boiled for 5 to 7 minutes in low flame and

strained well. It gave 200 ml of drumstick Leaves juice. Added 1 table spoon of jaggery and 5 drops of lemon juice.

- ❖ Pamphlets: –Distributed on dietary resources to manage and prevent Anaemia
- ❖ Nutritional exhibition: – Conducted on healthy eating, Dietary resources, healthy food habits and practices to manage and prevent Anaemia.

- **Physical indices**: Refers to the assessment of Body Mass Index by using WHO BMI (World Health Organization Body Mass Index) value, assessing the signs and symptoms of Anaemia with the check list which was developed by the investigator.
- **Bio chemical indices**: Refers to the clinical assessment of the Hemoglobin level by using calibrated Hemoglobinometer by the investigator.
- **Adolescent girls with Anaemia**: Refers to the girls between the age group of 13 to 19 years and having the hemoglobin level 7 to 11.9 gm/dl of blood which will be assessed by the calibrated hemoglobinometer.

WHO/UNICEF/ UNU graded the hemoglobin level

- 12 g/ dl - Non anemic
- 10 to 11.9 g/dl - Mild Anaemia
- 7 g/dl to 9.9 g/dl - Moderate Anaemia
- <7 g/dl - Severe Anaemia

1.5 RESEARCH HYPOTHESES

- RH1: There is a significant difference between the pre-test and post-test level of the physical and biochemical indices among adolescent girls with Anaemia.
- RH2: There is a significant relationship between the physical and bio-chemical indices of adolescent girls with Anaemia.
- RH3: There is a significant association of selected demographic variables with the level of physical and bio-chemical indices of adolescent girls with Anaemia.
- RH4: There is a significant difference of associative risk factors of Anaemia in experimental and control group
- RH5: There is a significant relationship between the associative risk factors and the level of Anaemia in experimental and control group.

1.6 ASSUMPTIONS

The study assumed that

- Rural adolescent girls may be affected with Anaemia
- Adolescent girls may be skipping the breakfast.
- Rural Adolescent girls may not have adequate knowledge about Anaemia.
- Proper diagnosis, early detection, iron supplementation and awareness may treat and reduce the risk of Anaemia among rural adolescent girls.

1.7 DELIMITATIONS

- Only rural adolescent girls were selected as a study samples.
- In this study samples were recruited by using purposive sampling method, not followed random sampling method
- Severe Anaemia girls were not included in this study.
- Married rural adolescent girls were excluded in this study
- Not assessed other related hematocrit values of Anaemia

CHAPTER II

REVIEW OF THE LITERATURE: The review of the literature organized under the following sections:

SECTION A: Studies related to the prevalence of Anaemia

- **Jeevithan Shanmugam et al 2023.** conducted an analytical cross-sectional study in a senior secondary public school, located in Coimbatore district, Tamil Nadu, to estimate the prevalence of Anaemia among adolescents in the age group of 10 to 19 years. A semi-structured, pretested proforma that included haemoglobin estimation using oxyhemoglobin method. Through this study the overall prevalence of Anaemia was 88.6% (95% CI 87.2 to 89.8); it was ten percent points higher in females (93.8%, 95% CI 92.1 to 95.1) compared to males (83.9%, 95% CI 81.7 to 85.8)[17].
- **Shekhar Chauhan et al., 2022** conducted the study of prevalence of Anaemia and the associated factors among adolescent boys and girls residing in Uttar Pradesh and Bihar among 20,594 adolescents aged 10–19 years. This study revealed that the Anaemia was more prevalent among adolescent girls than adolescent boys (20% vs. 8.7%). Moderate/severe Anaemia was 0.24 and 0.49 times less likely among adolescent boys and girls, respectively, who had 10 and above years of schooling than adolescents with no schooling ($p < 0.01$)[5].

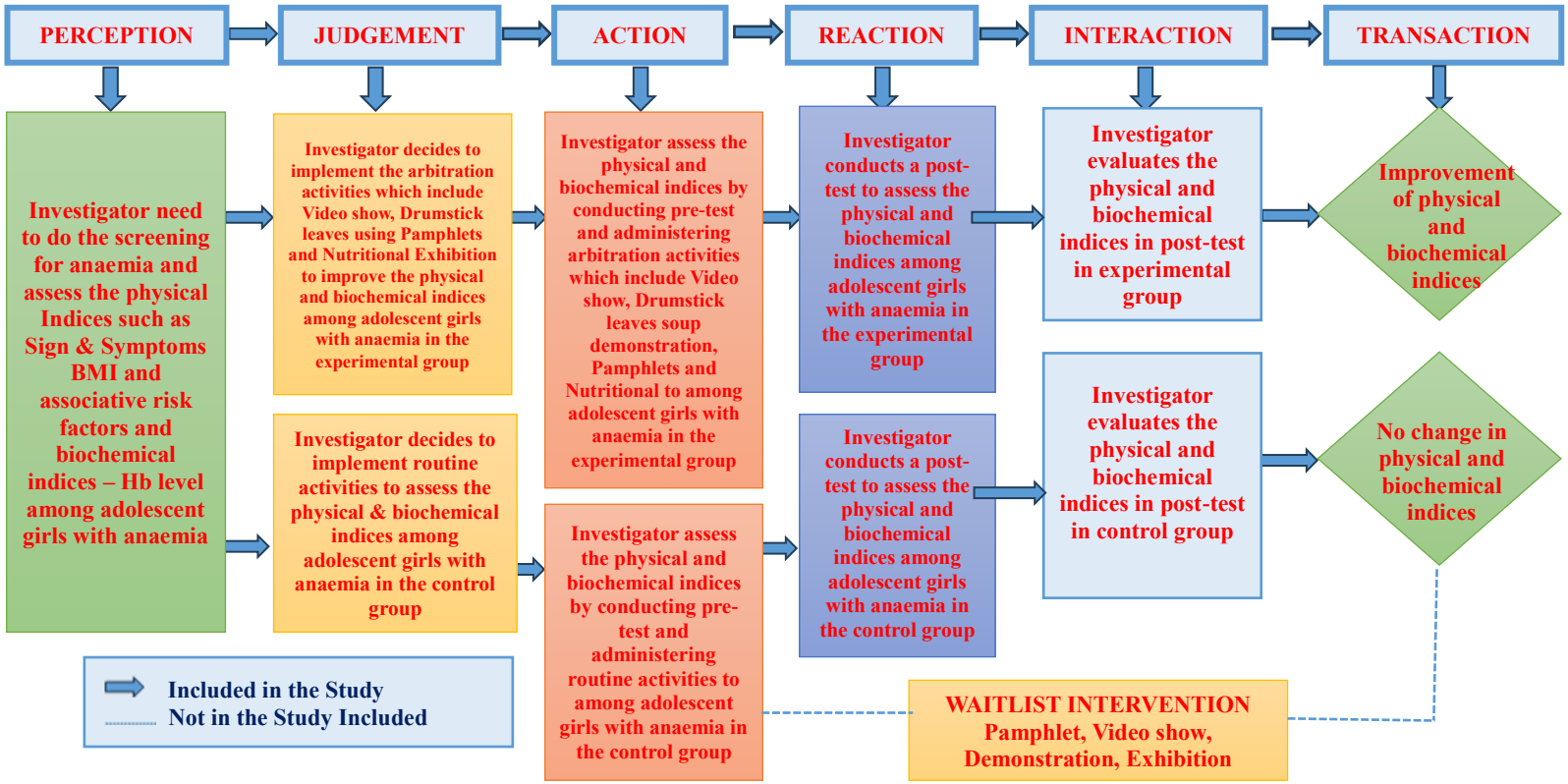
SECTION B: Studies related to the factors associated with Anaemia

- **Dr. Bhushan D. Kamble, et al 2021,** A cross-sectional study was conducted among 203 adolescent girls in government girls' school in Delhi. Haemoglobin estimation was done by HemoCue 201 and data regarding socio-demographic details, deworming, dietary preferences were collected. Clinical examination and anthropometric measurements were done. The prevalence of Anaemia was found to be 59% with mean (±SD) Haemoglobin of 11.3 gm/dl (±1.55). The majority (48%, n = 119) of anaemic girls had mild degree of Anaemia. 65% participants were of age 14–15 years with mean (±SD) age of 14.6 years (±1.18). There was a significant relationship between Anaemia and diet, deworming status, and BMI ($P < 0.05$)[6]

SECTION C: Studies related to drumstick leaves.

- **Mrs. R. Deepa et al (2020)** conducted a study to assess the effectiveness of drumstick leaves soup on level of haemoglobin among adolescent girls at selected college, Coimbatore by using one group pre-test post-test design. Purposive sampling with 24 adolescent girls between the age group of 17 years – 19 years were selected as sample for this study. Data collection was collected through structured questionnaire and checklist of clinical examination. Haemoglobin was checked before and after consumption of drumstick leaves soup. It was concluded that, drumstick leaves soup was helpful in improving the haemoglobin and reduction of discomforts among adolescent girls. The mean score was 0.6875, with standard deviation of 1.449. The standard error was 0.295, the calculated 't' value 2.331 was higher than the table value 2.06 at 0.05 level of significance. Hence there is a significant difference in the level of haemoglobin before and after the administration of drumstick leaves soup among adolescent girls with Anaemia[7].
- **Abhik Sarkar et al, (2021)** conducted a Randomized clinical trial among adolescent girls with mild and moderate Anaemia. 12 (Experimental n=6, Control n=6) adolescent girls with their hemoglobin level between 9-12 gm/dl were selected as samples. Intervention was started with one tea spoon (about 5gm) dried drumstick leaves powder supplementation once a day with meals for 30 days to the experimental group. At the end of intervention, the posttest hemoglobin level was assessed. The result revealed that the subject showed a significant improvement in Haemoglobin level at ($p<0.001$ level), drumstick leaves powder had significantly improved mean Haemoglobin levels in the post-test from (10.7167±0.25) to (11.1000±0.32) gm/dl[8].

1.8 CONCEPTUAL FRAMEWORK - BASED ON MODIFIED KING'S GOAL ATTAINMENT THEORY


PERCEPTION
JUDGEMENT
ACTION
REACTION
INTERACTION
TRANSACTION
Investigator need to do the screening for anaemia and assess the physical Indices such as Sign & Symptoms BMI and associative risk factors and biochemical indices – Hb level among adolescent girls with anaemia
Investigator decides to implement the arbitration activities which include Video show, Drumstick leaves using Pamphlets and Nutritional Exhibition to improve the physical and biochemical indices among adolescent girls with anaemia in the experimental group
Investigator decides to implement routine activities to assess the physical & biochemical indices among adolescent girls with anaemia in the control group
Investigator assess the physical and biochemical indices by conducting pre-test and administering arbitration activities which include Video show, Drumstick leaves soup demonstration, Pamphlets and Nutritional to among adolescent girls with anaemia in the experimental group
Investigator assess the physical and biochemical indices by conducting pre-test and administering routine activities to among adolescent girls with anaemia in the control group
Investigator conducts a post-test to assess the physical and biochemical indices among adolescent girls with anaemia in the experimental group
Investigator conducts a post-test to assess the physical and biochemical indices among adolescent girls with anaemia in the control group
Investigator evaluates the physical and biochemical indices in post-test in experimental group
Investigator evaluates the physical and biochemical indices in post-test in control group
Improvement of physical and biochemical indices
No change in physical and biochemical indices
Included in the Study
Not in the Study Included
WAITLIST INTERVENTION
Pamphlet, Video show, Demonstration, Exhibition

CONCEPTUAL FRAMEWORK BASED ON MODIFIED KING'S GOAL ATTAINMENT THEORY

CHAPTER III
RESEARCH METHODOLOGY

3.1 RESEARCH APPROACH:

Quantitative research approach

3.2 RESEARCH DESIGN:

Quasi-Experimental Pre-test Post-test Design.

3.3 RESEARCH VARIABLES

- **Independent Variable:** Arbitration activities such as IEC on Anaemia, Drumstick leaves soup for three months, Pamphlets on dietary resources to manage and prevent Anaemia, Exhibition on healthy eating, dietary habits and practices
- **Dependent Variables:** Physical and Biochemical Indices such as Body Mass Index signs and symptoms of Anaemia, Associative risk factors- Menstrual, Dietary and Helminthic factors and Haemoglobin level.
- **Matching Variables:** Age & level of Anaemia.
- **Demographic Variables:** It includes **a**ge, education, religion, type of family, number of siblings, monthly income of the family, source of information, birth order, total number of family members, family history of Anaemia, father's & mother's education, father's & mother's occupation, ddietary habit, rregularity of menstruation, age at menarche, Nature of Menstrual cycle, and de-worming

3.4 RESEARCH SETTING:

The study was conducted at the selected rural areas at Madurai

3.5 POPULATION

- **Target Population:** The population of the present study comprised of all the adolescent girls with Anaemia.
- **Accessible Population:** All the adolescent girls with Anaemia who were staying in the selected rural community, Madurai.

SAMPLE: Adolescent girls with Anaemia who fulfilled the inclusion criteria.

3.6 SAMPLING TECHNIQUE:

Non-probability Purposive sampling technique adopted for this study

3.7 SAMPLE SIZE:

The sample size was 170 (85 in each group)

3.8 SAMPLING CRITERIA

Inclusion Criteria: Adolescent girls	**Exclusion Criteria:** Adolescent girls
➢ Who were in the age group of 13 – 19 years. ➢ Who had mild and moderate level of Anaemia ➢ Who knew to read and write in Tamil ➢ Who were willing to participate	➢ Who were having any other blood disorders such as sickle cell Anaemia, hemophilia, and thrombocytopenia. ➢ Who were under the treatment for Anaemia ➢ Who had adverse reactions to the ingestion of drumstick leaves juice ➢ Who were married and pregnant ➢ Who were having chronic morbidity condition

3.9 DATA COLLECTION TOOL

Part I: Screening: Adolescent girls are screened for Anaemia using HEMOGLOBINOMETER for recruitment of the samples. Adolescent girls with mild and moderate Anaemia were recruited for the study

Scoring - as per WHO (World Health Organization)

Category	Classification
Normal	12 gm/dL and above
Mild Anaemia	11 to 11.9 gm/dL
Moderate Anaemia	8 to 10.9 gm/dL
Severe Anaemia	< 8 gm/dL.

Part II: Demographic Variables: Demographic Variables such as age, education, religion, type of family, number of siblings, monthly income of the family, source of information, birth order, total number of family members, family history of Anaemia, father & mother education, father & mother occupation, Dietary Habit (Veg/Non-Veg), De-worming, Age at menarche and Nature of Menstrual cycle.

Part III: **Assessment of Physical Indices**:

Observation - Computation of Body Mass Index.

Measured the participants height and weight to designate a classification. The formula is BMI = kg/m^2; kg is a person's weight in kilograms and m^2 is height in meters squared.

BMI (Body Mass Index) values as per WHO (World Health Organization)

Range	Classification
18.5 to 24.9	Normal
25-25.9	Overweight
30 and above	Obese
<18.5	Underweight

Part IV: **Check list - Assessment of Signs and Symptoms of Anaemia**

Check list with 21 items used to assess the signs and symptoms of Anaemia If sign or symptom present 1 mark will be given, if it is absent 0 mark was given

Scoring Key:

Range	Classification
15 – 21	Severe
8-14	Moderate
1-7	Mild
0	No Anaemia

Part V: Rating Scale to assess the associative risk factors of Anaemia with 24 items used to assess the Menstrual factors, Dietary factors & Helminthic factors

Scoring Key

Range	Category
0-30	No risk for Anaemia
31 - 60	Mild risk for Anaemia
61 - 90	Moderate risk for Anaemia
91 – 120	Severe risk for Anaemia

Part VI: Checklist to assess the Perceived satisfaction level

Totally 10 items used to assess the Perceived satisfaction level among the experimental group.

Scoring Key

Range	Category
1-10	Strongly Dissatisfied
11 - 20	Dissatisfied
21 - 30	Satisfied
31 – 40	Strongly Satisfied

Part I, II, III, IV, V and VI - Tools devised by investigator after an extensive review of related literature.

3.10 VALIDITY OF THE TOOL

The study was discussed in the research advisory committee and approved. The suggestions were incorporated and later sent for validation from external experts. Content validity was obtained from 3 Nutritional experts, 6 Nursing experts, and 1 Ayurvedic expert. Suggestions given by the experts were incorporated into the main study.

3.11 RELIABILITY OF THE TOOL

After pilot study reliability of the tool was assessed by using inter-rater method. Body Mass Index, Hemoglobin estimation, Signs & Symptoms and Associative risk factor's reliability correlation coefficient value were 0.82,0.92.0.80 and 0.84. These correlation coefficients were highly reliable for assessing effectiveness of arbitration activities on physical and biochemical indices among adolescent girls with Anaemia.

3.12 PILOT STUDY

The pilot study was conducted at Kovilpapakudi village from April 2022 to November 2022 among adolescent girls after ensuring the validity and reliability of the tool. The study conducted among 20 adolescent girls who were having Anaemia. Every alternative girl-10 were assigned as experimental group, remaining 10 were assigned in to control group. Interventions carried out and the statistical analysis proved that the arbitration activities were effective and the study was found feasible.

3.13 DATA COLLECTION PROCEDURE

Formal permission obtained from the Head of the rural community- Panchayat Leaders. Ethical clearance obtained from Institutional Human Ethical Committee of Dhanvantri Critical Care Centre, Dhanvantri Multi speciality Hospital Erode, Reference Number DCC/IEC/043/2021 on 8/11/2021. Informed written consent from the parent and assent obtained from the adolescent girls. Screening for Anaemia was done by using digital hemoglobinometer among 225 adolescent girls and whose haemoglobin is lower than 12 gms/dl were recruited as study samples. (50 were excluded from the study Severe 7, 43 - Normal). By using Non probability Purposive sampling technique Adolescents in Pannaikudi village were taken as experimental group- 88, Adolescents in Achampatti village-87 were taken as control group.

SCREENING PROCESS

Group / Village	Screened	Mild	Moderate	Severe	No anaemia	Recruited
Experimental Group Pannaikudi	100	67	21	2	17	88
Control group Achampatti	125	64	23	5	26	87

On the day of screening Deworming was done with Tab.Albendazole 400 mg, HS between 8.30 pm to 9 pm after dinner. Pretest was done on 1st day then interventions were carried out for 3 months to the adolescent girls with Anaemia in the experimental group. Post test was done after 3 months and 6 months. Wait list interventions were given to all the adolescent girls in the control group. Local volunteers were appointed in both the villages for motivation and follow-up.

Daily Diary maintained by the samples regarding the ingestion of drumstick leaves soup as per the recommendation.

INTERVENTIONAL TOOL

1. Drumstick Leaves Soup:

Handpicked, cleaned and washed Drumstick leaves of 50gm boiled in 300 ml of water and boiled for 5 to 7 minutes in low flame and strained well. It gave 200 ml of drumstick Leaves juice. Added 1 table spoon of jaggery and 5 drops of lemon juice.

As per the obtained nutritional value Per 100 ml- Iron 4.5mg, Calcium 60mg, Folic acid 7mcg, Vitamin C 1.2 mg. First day Demonstration of preparation of drumstick leaves soup was done and given to each subject at their home by the investigator. Assured to continue to take for 3 months on alternative days by the participants. The investigator spent 15 to 20 minutes for each participant. Daily 200 ml of drumstick leaves juice once in a day consumed by the adolescent girls along with the breakfast. Consumed for three months on alternative days. Teaching on the preparation of Drumstick leaves juice was done with all the needed instruction by the investigator before starting the self-preparation by the participants on the first day of the intervention. At the end of the intervention after 3 months and 6 months drop of capillary blood taken from the adolescent girls and checked the Haemoglobin level by using Calibrated Hemoglobinometer by the investigator.

Inhibitors of iron absorption such as tea and coffee were avoided along with the dietary supplementation during the intervention. Leaves from the roots was not consumed.

2.Pamphlets – Pamphlets on dietary resources to manage and prevent Anaemia were distributed at the time of demonstration of drumstick leaves soup preparation.

3. Nutritional Exhibition - Nutritional Exhibition conducted on Dietary resources, Healthy eating, dietary habits and practices to manage and prevent Anaemia for the adolescent girls.

4. IEC- IEC conducted by the investigator by using video show on causes, signs and symptoms, diagnosis, management and prevention of Anaemia in 1 hour of interactive session. Each interactive session conducted for 1 hour for 44 adolescents at a time. For both the experimental and control group, sessions were conducted on the same day, one in the morning and the other one in the afternoon. Nutritional Exhibition & IEC were carried out in the same day.

3.14 DROP OUT ANALYSIS

Group	Drop outs
Experimental Group	3/88*100 = 3.4%
Control Group	2/87*100 = 2.2%
Overall drop out	5/175* 100 = 2.8%.

The reason for dropout: The subjects migrated from the study setting due to their personal reasons. There was no substitution since the dropout rate was <10 % and it was happened in the Post test II. After the drop out the number of subjects in the Experimental group 85 & Control group 85.

3.15 QUALITY ASSUARANCE OF THE INTERVENTION:

Quality assurance of the Intervention monitored by Prof. M.Indhumathi, M.Sc., (N), residing at Madurai.

3.16 ETHICAL CONSIDERATION

The study was proposed in various Research Advisory Committee meetings and got revised. Formal permission obtained from the Head of the rural community- Panchayat Leaders.

Ethical clearance obtained from Institutional Human Ethical Committee of Dhanvantri Critical Care Centre, Dhanvantri Multispecialty Hospital Erode, Reference Number DCC/IEC/043/2021 on 8/11/2021. Informed written consent from the parent and assent obtained from the adolescent girls. Participants were informed regarding the purpose of the study. Benefits were explained. Flexibility in withdrawal from the study was also ensured. Confidentiality maintained. Interventions administered to the control group after the completion of the final post-test.

SCHEMATIC REPRESENTATION OF THE RESEARCH METHODOLOGY

<table>
<tr><th rowspan="3">S
C
R
E
E
N
I
N
G</th><th>Group</th><th>Pre
Test- 1</th><th>Arbitration
Activities</th><th>Post
Test-1</th><th>Post
Test-2</th></tr>
<tr><td>Experimental Group</td><td rowspan="2">Assessment of physical and Bio-Chemical Indices</td><td>• IEC on Anaemia
• Drumstick leaves soup for three months
• Pamphlets on dietary resources to manage and prevent Anaemia
• Exhibition on healthy eating, dietary habits and practices</td><td rowspan="2">Assessment of physical and Bio-Chemical Indices after 3 Months</td><td rowspan="2">Assessment of physical and Bio-Chemical Indices after 6 Months</td></tr>
<tr><td>Control Group</td><td>Routine Practices</td></tr>
</table>

CHAPTER IV

DATA ANALYSIS & INTERPRETATION

DATA ANALYSIS

Demographic distribution among Experimental and Control was tested using chi-square test. Quantitative variables difference between Experiment and Control was assessed using student independent t-test/Mann Whitney U-test. Correlation between Body Mass Index, Haemoglobin. Signs & Symptom and risk factors were analysed using Karl Pearson correlation coefficient method. Association among Body Mass Index, Haemoglobin. Signs & Symptom and risk factors with demographic variables were analysed using one-way analysis of variance F-test and student independent t-test. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS, version 22).

Description of Socio-demographic variables:

Majority of the girls were in the age group of 17-18 years 54 experimental, 40 in control group, majority of them 46 experimental,38 in control group were studying in the college, 65 experimental, 60 in control were belonging to nuclear family, the majority of them 75 experimental, 77 in control were Hindus, the majority of them 49 experimental, 44 in control were having one sibling in their family, 38 of experimental. 47 of control group of them were first born children, 46 experimental, 50 control group girls were having 2 to 4 members in their family, the majority of the girls experimental 4. control 46 were having the monthly family income Rs 8220 and above, 78 of experimental. 80 of control group girls were not having the family history of Anaemia, the majority of the girls experimental 28, control 32 mothers were completed secondary education, experimental group 54, control group 56 mothers were housewives, Fathers of experimental group 34 were completed their higher secondary education, fathers of 32 control group finished secondary education, majority of the experimental 33, 38 in control group fathers were doing own business.

The majority of the girls experimental 36, control group 40 were got the information's about Anaemia from their school & teachers, most of them experimental 68, 72 in control were non vegetarians, 35 of experimental and control group girls were taking non vegetarian foods once in a week, majority of them 53 of experimental, 51 of control group girls were not taken Deworming for last six months,

the majority of experimental group 67, control group 60 were not having any menstrual problems, the majority of 47 in experimental, 45 in control group were attained menarche in the age of 13 to 15 years, and majority of experimental group 68, 61 control group girls were having menstruation once in 28 days.

OBJECTIVE- 1:

To determine the effectiveness of arbitration activities on physical and biochemical indices among adolescent girls with Anaemia in experimental and control group.

Table 1: Level of Body Mass Index between Experiment and Control group

Body Mass Index level	Group				Mean Difference	Student Independent t test
	Experimental (N=85)		Control (N=85)			
	Mean	SD	Mean	SD		
Pre Test	21.22	4.07	20.57	3.61	0.65	t=1.10 p=0.27(NS)
Post Test I	21.56	3.91	20.60	3.60	0.96	t=1.65 p=0.10(NS)
Post Test II	22.03	3.91	20.68	3.56	1.35	**t=2.35 p=0.02*(S)**
ANOVA F-test	**F=6.29 p=0.01**(S)**		F=2.20 p=0.11 (NS)		**SIGNIFICANT**	

The above table revealed that there was no significant difference between experiment and control BMI score in the Pretest, Post test-I but there was a significant difference in Post test-II. Statistical significance was confirmed using independent t test.

In experimental group, Repeated measures F-test analysis showed that, mean overall BMI score was statistically significant between pretest and post-test-II (F = 6.29, P = 0.01). Therefore, we can conclude that arbitration activities are improving BMI significantly among adolescent girls with Anaemia. But in control group, mean overall Body Mass Index score was not statistically significant in pretest and post-test-II (F = 2.20, p=0.11). Therefore, we can conclude that routine practices were not improving BMI significantly among adolescent girls with Anaemia.

Graph 1: Comparing the pretest, post-test-I and post-test-II Body Mass Index level

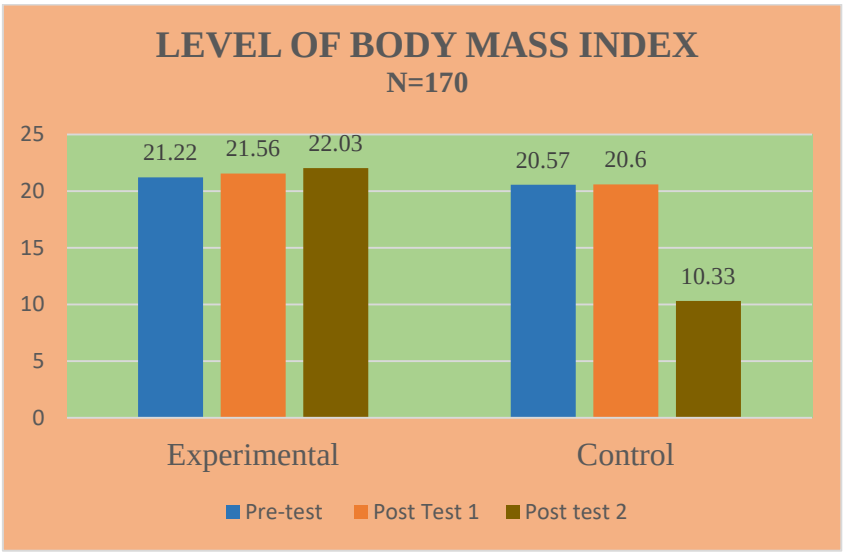


Table 2: Level of Signs & Symptoms of Anaemia in Experiment and Control group

Signs & Symptoms	Group				Mean Difference	Student Independent t=test
	Experimental (N=85)		Control (N=85)			
	Mean	SD	Mean	SD		
Pre Test	7.35	4.17	7.04	3.19	0.31	t=0.56 p=0.58(NS)
Post Test-I	5.21	4.53	6.92	3.43	1.71	**t=2.77 p=0.01**(S)**
Post test-II	2.96	3.81	6.60	3.07	3.64	**t=6.86 p=0.001***(S)**
ANOVA F-test	**F=62.38 p=0.001***(S)**		F=1.97 p=0.11(NS)		**SIGNIFICANT**	

The above table stated that there was significant difference between experimental and control group in post-test II. Statistical significance was confirmed using independent t test.

In experimental group, Repeated measures F-test analysis showed that, level of Signs & Symptom of Anaemia was statistically significant between pretest and post-test-II ($F = 62.38, P = 0.001$). Therefore, we can conclude that arbitration activities were effective in reducing the level of Signs & Symptoms of Anaemia significantly among adolescent girls with Anaemia.

Graph 2: Comparing the level of Signs & Symptoms in the experimental and control group during pre-test, post-test-I, and post-test-II

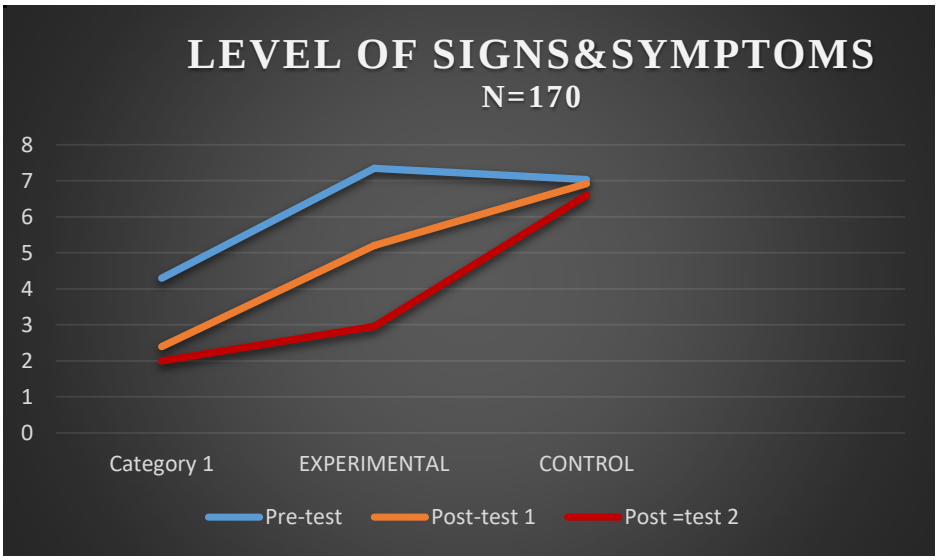
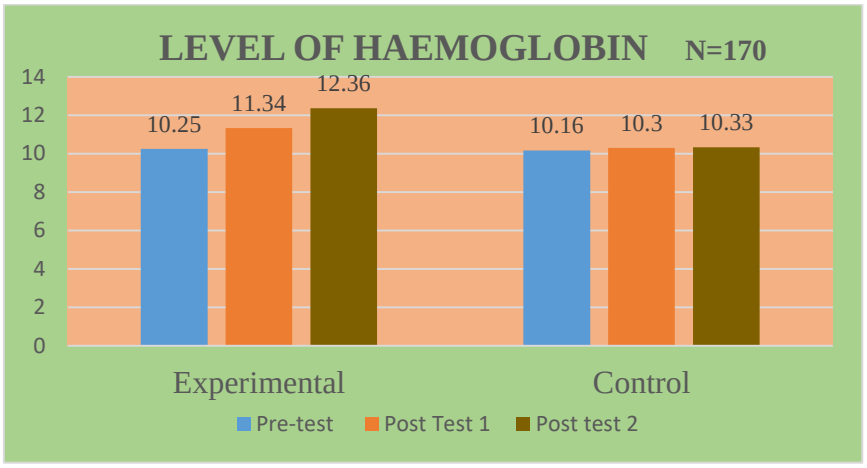


Table 3: Level of Haemoglobin in Experiment and Control group of adolescent girls

Haemoglobin Score	Group				Mean Difference	Student Independent t=test
	Experimental (N=85)		Control (N=85)			
	Mean	SD	Mean	SD		
Pre Test	10.25	1.65	10.16	1.50	0.31	t=0.35 p=0.72(NS)
Post Test - I	11.34	1.62	10.30	1.39	1.71	**t=4.47 p=0.001***(S)**
Post Test -II	12.36	1.40	10.33	1.37	3.64	**t=9.58 p=0.001***(S)**

The above table described the comparison of level of haemoglobin in experimental and control group of adolescents during Pretest, Post test-I, Post test-II. In pretest there was no significant difference between experiment and control group. In posttest1, post test II there was a significant difference between experiment and control group. Statistical significance was confirmed using independent t test.

Graph 3: Comparing the mean level of Haemoglobin in the experimental and control group



The research hypothesis stated earlier that "There is a significant difference between the pretest and post-test level of the physical and biochemical indices among adolescent girls with Anaemia" ACCEPTED

Table 4: Associative risk factors of Anaemia in Experimental and Control group

S. No.	Risk Factors	Group				Difference	Student independent t=test
		Experimental (N=85)		Control (N=85)			
		Mean	SD	Mean	SD		
Pre test	Menstrual Factors	21.52	6.33	20.95	5.25	0.57	t=0.64 p=0.52(NS)
	Dietary factors	30.78	6.56	29.92	4.56	0.86	t=0.99 p=0.32(NS)
	Helminthic factors	10.23	2.95	11.06	3.37	-0.83	t=1.71 p=0.09(NS)
	Risk factors	62.53	12.89	61.93	13.51	0.60	t=0.30 p=0.77(NS)
Post test-I	Menstrual factors	16.40	4.84	20.34	5.43	-3.94	t=0.29 p=0.60(NS)
	Dietary factors	25.70	4.32	29.76	4.47	-4.06	t=0.90 p=0.36(NS)
	Helminthic factors	7.39	2.97	10.91	3.44	-3.52	t=1.99 p=0.10(NS)
	Risk factors	49.49	7.60	61.01	13.40	-11.52	t=5.51 p=0.001***(S)
Post test-II	Menstrual factors	14.20	3.70	20.09	5.29	-5.89	t=8.41 p=0.0012***(S)
	Dietary factors	23.40	3.63	29.69	4.38	-6.29	t=10.91 p=0.001***(S)
	Helminthic factors	5.10	1.57	10.66	3.26	-5.56	t=8.41 p=0.001***(S)
	Risk factors	37.38	13.10	60.44	12.41	-23.06	t=14.17 p=0.001***(S)

The above table described the level of risk factors among experimental and control group of adolescents in the Pretest, Post test-I, Post test-II. In pretest there was no significant difference between experiment and control group. In post test1& post-test II there was a significant difference between experiment and control group.

The research hypothesis stated earlier that "There is a significant difference of associative risk factors of Anaemia in experimental and control group" ACCEPTED

OBJECTIVE 2: To identify the relationship between the physical and biochemical indices among adolescent girls with Anaemia in experimental and control group.

Table 5: Relationship between the physical and biochemical indices among adolescent girls with Anaemia in experimental and control group.

S. No.	Correlation	Experimental Group N=85		Control Group N=85	
		Karl Pearson Correlation coefficients	Interpretation	Karl Pearson Correlation coefficients	Interpretation
1	Haemoglobin Vs Body Mass Index	r= 0.42 p=0.001***	Significant positive moderately correlation	r= 0.12 p=0.76	No significant correlation
2	Haemoglobin Vs Signs & Symptoms	r= 0.44 p=0.001***	Significant positive moderate correlation	r= 0.16 p=0.25	No significant correlation
3	Haemoglobin Vs Risk factors	r= 0.35 p=0.01**	Significant positive moderate correlation	r= 0.17 p=0.22	No significant correlation
4	Body Mass Index Vs Signs & Symptoms	r= 0.30 p=0.01**	Significant positive fair correlation	r= 0.18 p=0.09	No significant correlation
5	Body Mass Index Vs Risk factors	r= 0.27 p=0.01**	Significant positive poor correlation	r= 0.14 p=0.24	No significant correlation
6	Signs & Symptoms Risk factors	r= 0.27 p=0.01**	Significant positive fair correlation	r= 0.15 p=0.34	No significant correlation

The Hypothesis stated earlier that "There is a significant relationship between the physical and bio-chemical indices of adolescent girls with Anaemia" ACCEPTED for experimental group and REJECTED for control group.

OBJECTIVE 3: To find the association of selected demographic variables with the mean difference level of physical and biochemical indices

Table 6: Association of selected demographic variables with the mean difference level of physical and biochemical indices

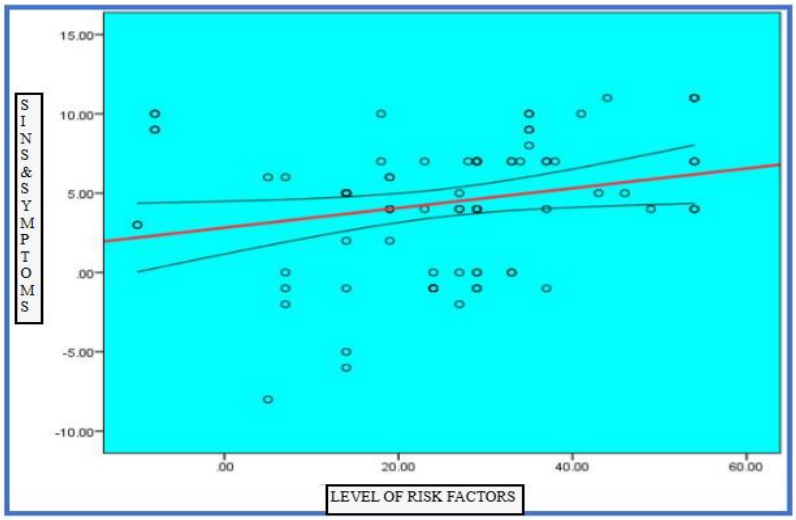
Group N=85 +85	Association with Demographic Variables	Demographic variables having Significant association
Experimental	Level of Haemoglobin	Age, Class, Type of family, Mens trual Problems at 0.05 level
Control		None
Experimental	Level of Body Mass Index	Age, Class studying at 0.05 level
Control		None
Experimental	Level of Signs & Symptoms	Age, De-worming, Menstrual Problems at 0.05 level
Control		None
Experimental	Risk Factors	Age, Deworming, Menstrual Problems, Duration of Menstruation at 0.05 level
Control		Source of Information at 0.01 level

The Hypothesis stated earlier that "There is a significant association of selected demographic variables with the level of physical and bio-chemical indices of adolescent girls with Anaemia" - ACCEPTED for Experimental group and REJECTED for the control group except for the demographic variable Source of Information.

Table 7: Relationship between the associative risk factors and the level of Anaemia in experimental and control group

Group	Variables	r Value	Correlation
Experimental N=85	Level of Haemoglobin Vs Associative risk factors of Anaemia	r= 0.35 P=0.01**	Significant positive moderate correlation
	Level of Body Mass Index Vs Associative risk factors of Anaemia	r= 0.27 P=0.01**	Significant positive Poor correlation
	Level of Signs & Symptoms Vs Associative risk factors of Anaemia	r= 0.27 P=0.01**	Significant positive fair correlation
Control N=85	Level of Haemoglobin Vs Associative risk factors of Anaemia	r= 0.17 P=0.22	No significant correlation
	Level of Body Mass Index score Vs Associative risk factors of Anaemia	r= 0.14 P=0.24	No significant correlation
	Level of Signs & Symptoms Vs Associative risk factors of Anaemia	r= 0.15 P=0.34	No significant correlation

Graph 4: Relationship between the Signs & Symptoms and Level of risk factors



The above graph showed that there was a positive correlation between the level of Signs & Symptoms and Level of risk factors

RH5: The research Hypothesis stated earlier that "There is a significant relationship between the associative risk factors and the level of Anaemia in experimental and control group REJECTED for control group and ACCEPTED for experimental group

PERCEIVED LEVEL OF SATISFACTION- EXPERIMENTAL GROUP

Graph 4: Perceived level of satisfaction- experimental group

The above graph revealed that 98% of the girls were very much satisfied and 2% of the girls were satisfied in the experimental group. None of them had mild dissatisfaction and dissatisfaction.

CHAPTER V

RESULTS AND DISCUSSION

OBJECTIVE 1: To determine the effectiveness of arbitration activities on physical and biochemical indices among adolescent girls with Anaemia between experimental and control group.

The present study revealed that there was a significant change in the physical and bio chemical indices after the arbitration activities. There was a significant difference in the level of Body Mass Index in the experimental group with the "t" value 0.25 (p=0.02) in the post-test II, F value = 6.29 (p=0.01) in the experimental group, and in the control group F= 2.20 (p=0.11) by one-way repeated measures of Anova test. Also, the value in the experimental group increased from 21.22 in the pretest to 22.03 in the post-test II in the experimental group.

Regarding the signs & Symptoms of Anaemia by using the student independent "t" test the "t" value in the experimental group in the post-test II was 6.86 (p=0.001), also F value was 62.38 (p=0.001) which were highly significant in the experimental group. Also, the mean in the pretest 7.35 was reduced in to 2.96 in post-test II in the experimental group.

Regarding the Haemoglobin level in the post-test II the level mean increased from 10.25 in the pretest to 12.36 in the post-test II in the experimental group, Also the independent "t" test revealed that there was a significant difference in the haemoglobin level with the "t" value of 9.58 (p=0.001), F= 96.64 (p=0.001) which were highly significant.

So, it was concluded that arbitration activities were highly effective on physical and biochemical indices among adolescent girls with Anaemia.

This study was consistent with the study conducted by **Jayasree GS1 et al** among 60 reproductive age group women (15-45) in the army cantonment area Bathinda Punjab, Drumstick leaves juice was freshly prepared and administered for 30 days to the experimental group. Pre-test and post-test estimation of hemoglobin was done be using cyanmethamoglobin method. The mean hemoglobin level of experimental group before administering 100ml drumstick leaves juice was 11.43 with a standard deviation ± 0.91, It was increased in to ±12.36 with a standard deviation ± 0.69. Comparing to control group the hemoglobin level of experimental group is improved[19].

OBJECTIVE 2: To identify the relationship between the physical and biochemical indices among adolescent girls with Anaemia in experimental and control group.

In the experimental group, there was a significant correlation between level of Haemoglobin with Body Mass Index (r= 0.42 P=0.001***) level of Haemoglobin with Signs & Symptoms (r= 0.44 P=0.001***) level of Haemoglobin with associative risk factors of Anaemia (r= 0.35 P=0.01**) level of Body Mass Index with Signs & Symptoms (r= 0.30 P=0.01**) Level of Body mass Index with associative risk factors of Anaemia (r= 0.27 P=0.01**) Level of Signs & Symptoms with associative risk factors of Anaemia (r= 0.27 P=0.01**) Whereas in the control group there was no significant relationship between the physical and biochemical indices among adolescent girls with Anaemia.

OBJECTIVE 3: To find the association of selected demographic variables with the mean difference level of physical and biochemical indices among adolescent girls with Anaemia in experimental and control group.

In experimental group the level of Haemoglobin was having significant association with the demographic variables such as Age, Class, Type of family, Menstrual Problems at 0.05 level, level of Body Mass Index was having significant association with demographic variables such as Age, Class studying at 0.05 level, Level of Signs & Symptoms was having significant association with demographic variables such as Age, De-worming, Menstrual Problems at 0.05 level, level of associative risk factors with demographic variables such as Age, Deworming, Menstrual Problems, Duration of Menstruation at 0.05 level

But in control group the physical and bio chemical indices were not having association with demographic variables. The level of associative risk factors with demographic variable Source of Information was having significant association at 0.01 level

SECONDARY OBJECTIVES

OBJECTIVE 4: To screen the adolescent girls for Anaemia

Screening for Anaemia was done by using digital hemoglobinometer among 225 adolescent girls and whose Haemoglobin is lower than 12 gms/dl were recruited as study samples. (50 were excluded from the study Severe 7, 43 - Normal)

OBJECTIVE 5: To compare the associative risk factors of Anaemia in experimental and control group.

The overall mean for associative risk factors in the pretest - experimental group was 62.53, in the control group 61.93. In the post-test II it was 37.38 in experimental and in the control group 60.44 with the “t” value 14.17 (P=0.001) which was showing the significant difference after arbitration activities. All the associative risk factors including menstrual, Dietary factors and helminthic factors the “t” values were 8.41, 10.91, 8.41 which were highly significant at P=0.001 level.

This study was consistent with the study findings of the study conducted by **Ashis Talukder et al (2022),** indicated that the mean of the respondent's hemoglobin level was 60 with a standard deviation (SD) of 11.73. The minimum value of the hemoglobin level is 2.00, while the maximum is 99.60. From the estimate of quantile regression, women's education level, wealth index, place of residence, the contraceptive method during pregnancy, body mass index (BMI), and source of drinking water were the significant risk factors for developing Anaemia among women of reproductive age[20].

OBJECTIVE 6: To assess the relationship between the associative risk factors and the level of Anaemia in experimental and control group

There was a significant correlation with Associative risk factors of Anaemia with Haemoglobin level, Body Mass index, Signs & Symptoms of Anaemia with the “r” value of 0.35, 0.27, 0.27 respectively in the experimental group. In the control group there was no significant correlation with Associative risk factors of Anaemia.

Mamosai Zewar and Sourabh Chakraborty (2022) conducted a cross-sectional quantitative study among 385 Women of Reproductive Age (WRA) based face to face interviews showed that the mean Haemoglobin level was 52.1% (95% CI:50.7-53.4). In multivariate analysis, Anaemia was significantly associated with age group, family income, nutritional habits, drinking tea with food, use of iron tablets, irregular menstruation, birth spacing, and history of Anaemia. It was concluded that, Policymakers must develop appropriate practical and context-based policies and initiatives to better address Anaemia in women during their reproductive years[21].

OBJECTIVE 7: To assess the perceived satisfaction level of intervention for the study group

98% of them were very much satisfied with the arbitration activities and 2% of them were satisfied with the arbitration activities among the adolescent girls with Anaemia in experimental group.

CHAPTER VI

SUMMARY, CONCLUSION, RECOMMENDATIONS & LIMITATIONS

6.1 SUMMARY

An interventional study was conducted to assess the effectiveness of arbitration activities on physical and biochemical indices among 170 rural adolescent girls with anaemia. Screening for anaemia was done to recruit the samples. By using Non probability Purposive sampling technique 85 were assigned in the experimental group and 85 were in the control group. Pre-test was done by using observation, check list and rating scale. Interventions were carried out by using IEC, drum stick leaves soup intake for three months, pamphlets, and nutritional exhibition to the experimental group. Post-test was conducted at 3rd and 6th month after the intervention. Descriptive and inferential statistics were used to analyse the data. Statistical analysis revealed that arbitration activities were effective on physical and biochemical indices of rural adolescent girls with anaemia in the experimental group.

6.2 CONCLUSION

Anaemia can be dangerous, which can produce serious consequences, disturbs the day-to-day activities, it reduces the oxygen supply to vital organs, causing permanent damage. As a future mother, it is important to prevent Anaemia at the very early stage.

This study concluded that there is a significant improvement in physical and biochemical indices in the experimental group after the arbitration activities. Arbitration activities are integrative comprehensive and holistic strategies to increase the Body mass index, Haemoglobin level, reducing the Signs & Symptoms and associative risk factors of Anaemia. The study has also demonstrated the need for education and awareness for the adolescent girls about healthy eating and drumstick leaves soup was safe, simple, easily available with rich iron component used to prevent and treat Anaemia and to improve the quality of life. The study has not only helped in capacity building but also has emphasized on the sustainability and consistency of the families to protect, prevent and manage Anaemia at household level.

6.3 STRENGTHS OF THE STUDY

- The feasibility and success of the study were also greatly aided by the favorable environment, the girl's willingness to engage in the interventional programs, and their adherence during the intervention period.
- Inexpensive, effective & easy intervention
- Researcher could manage to follow up the required participants till the final posttest; meeting the attrition.
- A well-planned intervention delivered based on robust review of literature.
- A good team work involving the principal investigator, research guide, research co guide, expert members, participants of the study and local volunteers
- Self-motivation of the participants by various cosmetic and health benefits of the interventions

6.4 LIMITATIONS OF THE STUDY

- Consumption drum stick leaves juice was a personalized interventions by the participants.
- Relayed only on their personal diaries, direct enquiry and the report from the local volunteer.
- The investigator spent more time to convince the participants for the strict compliance with the intervention.
- Iron and folic acid tablet administration at school may have impact over this study
- Family dietary practices may influence the study findings.

6.5 RECOMMENDATIONS OF THE STUDY

- Comparative studies can be conducted Urban Vs Rural Girls, Married Vs Unmarried girls and Boys Vs girls.
- Gender discrimination can be studied at the family on the account of Anaemia
- Other Health benefits of the drumstick leaves can be studied along with the Haemoglobin changes
- Similar studies can be conducted for larger sample size.
- Studies can be done by using randomized sampling method.

6.6 IMPLICATIONS OF THE STUDY

Nursing Education

- ✧ Nursing educator should be updated with complimentary alternative medicine for reducing Anaemia
- ✧ Nurse educators should take initiative in organizing continuing nursing education program on complimentary & alternative medicine to control Anaemia
- ✧ Nurse educators need to arrange the anaemia prevention campaigns for the students to enhance their awareness on anaemia.

Nursing Practice

- ✧ Nurses plays a vital role in detecting Anaemia among the adolescent girls also they are key person to identify the risk factors to control Anaemia
- ✧ Nurses should treat Anaemia with available, cost effective and effective measures
- ✧ Nurse practitioners need to be update their knowledge with the anemias management protocols in the hospitals and community settings.

Nursing Research

- ✧ Nurse researcher needs to conduct various adolescent girls' health issues and different perspectives of adolescent health behavior
- ✧ Need to conduct more researches regarding the dietary practices of adolescents
- ✧ Proper attention should be given to the adolescent girls with Anaemia and more researches required for the treatment of anaemia

Nursing Administration

- ✧ Health polices need to be framed to address the health issues related to Anaemia
- ✧ Preventive strategies should be planned and implemented to all the adolescent girls to control Anaemia.
- ✧ Intensive evaluation and follow up of services mandatory to prevent Anaemia and to control further reproductive health care issues.

BIBLIOGRAPHY

VII. REFERENCES

1. https://www.who.int/data/gho/data/indicators/indicator-details/GHO/Anaemia-in-women-of-reproductive-age-number-(in-thousands)
2. https://www.practo.com/healthfeed/iron-deficiency-Anaemia-the-silent-threat-to-women-s-reproductive-health-50613/post
3. https://sukarya.org/2024/02/25/empowering-adolescent-girls-a-keystone-for-national-progress/#:~:text=Adolescent%20girls%20are%20central%20to,children%2C%20and%20secure%20higher%20incomes.
4. Subramanian M, Malhotra S, Kant S, Goswami K, Perumal V, Kaloiya G. Prevalence of Anaemia Among Adolescent Girls Residing in Rural Haryana: A Community-Based Cross-Sectional Study. Cureus. 2022 Jan 10;14(1): e21091.
5. Chauhan, S., Kumar, P., Marbaniang, S.P. et al. Prevalence and predictors of Anaemia among adolescents in Bihar and Uttar Pradesh, India. Sci Rep 12, 8197 (2022).
6. Kamble BD, Gunjan M, Sumit J, Singh SK, Jha D, Singh S. Prevalence of Anaemia among school going adolescent girls attending Test, Treat and Talk (T-3) camp under Anaemia Mukt Bharat in Delhi. J Family Med Prim Care. 2021 Feb;10(2):898-903.
7. Mrs. R. Deepa, Dyana. P, Gayathri. S, Gowri. C, Gokulraj. S, Dheenathayalan. V. Drumstick leaves soup on level of Haemoglobin. Int. J. Nur. Edu. and Research. 2020; 8(2):161-165.
8. Sarkar, Abhik et al, A pilot study to assess the effectiveness of drumstick leaves powder supplementation in prevention of Anaemia among adolescent girls. International Journal of Obstetrics and Gynaecological Nursing. 01/07/2021.32(3) 29.
9. Scott, S et al (2022). Anaemia in Indians aged 10–19 years: Prevalence, burden and associated factors at national and regional levels. Maternal & Child Nutrition, 18, e13391.
10. Rahmawati, N., Mareta, R., & Subrata, S. A. (2023). Moringa leaves for Anaemia treatment among teenagers. Innovation in Health for Society, 3(1), 41-48.
11. Balebu DW et al, The Miracle of Moringa Oleifera Leaves for the Prevention of Anaemia: A Literature Review. Pharmacogncy Jounal. 2023;15(6) Suppl: 1258-1261.
12. Laode Muslimin et al, The Effect of Anti-nutrition and Bioavailability of Iron of Moringa Oleifera on Rat Hematology Model Iron Deficiency Anaemia. Review Article. Journal of Food and Nutrition Research. 2023; 11(1):25-36.
13. Rotella R et al, The Impact of Moringa oleifera Supplementation on Anaemia and other Variables during Pregnancy and Breastfeeding: A Narrative Review. Nutrients. 2023 Jun 8;15(12):2674.

14. Khanam M et al,Effects of Moringa oleifera leaves on hemoglobin and serum retinol levels and underweight status among adolescent girls in rural Bangladesh. Front Nutr. 2022 Jul 22; 9:959890.
15. Gusti Ayu Tirtawati et al, Moringa oleifera Teabags Increase Hemoglobin in Adolescent Females.Open Access Maced J Med Sci. 2021 Jun 16; 9(A). Pp 393-396
16. Chakrabarty M, Singh A, Singh S, Chowdhury S. Is the burden of Anaemia among Indian adolescent women increasing? Evidence from Indian Demographic and Health Surveys (2015-21). PLOS Glob Public Health. 2023 Sep 6;3(9): e0002117.
17. Shanmugam J, Kumar M, G D, Ravikumar S. Prevalence and Determinants of Anaemia Among Adolescents in Coimbatore District, Tamil Nadu – A School Based Analytical Cross-Sectional Study. Natl J Community Med [Internet]. 2023 Jan. 31 [cited 2025 Mar. 25];14(01):3-9.
18. https://nhm.gov.in/index1.php?lang=1&level=3&sublinkid=1448&lid=797
19. Jayasree GS1 et al, (2020): Effectiveness of Drumstick Leaves Juice on Hemoglobin Level among Reproductive Age Group Women in A Selected Community Area, Bathinda, Punjob Indian Journal of Public Health Research & Development, June 2020, Vol. 11, No. 6. Pp 425-28
20. Ashis Talukder, Nupur Paul, Zahidul Islam Khan, Benojir Ahammed, Iqramul Haq, Mohammad Ali, Risk factors associated with Anaemia among women of reproductive age (15–49) in Albania: A quantile regression analysis, Clinical Epidemiology and Global Health, Volume 13, 022, 100948, ISSN 2213-3984
21. Mamosai Zewar and Sourabh Chakraborty (2022) Assessing the prevalence and risk factors of Anaemia in women of reproductive age attending primary health care in Afghanistan's Provinces of Kabul, Nangarhar, and Heart. Clin. Pract. (2022) 19(2), 1907-1919
22. Daniel RA, Kalaivani M, Kant S, Gupta S. Prevalence of anaemia among adolescent girls (10–19 years) in India: A systematic review and meta-analysis. Natl Med J India 2023; 36:233–40.

ANNEXURES

SRI BALAJI VIDYAPEETH
Examinations

OFFICE OF THE CONTROLLER OF EXAMINATIONS
Dr. **S. SRIRANGARAJ**
Controller of Examinations

Date: 14-03-2022

No. SBV/COE/Ph.D/Feb-22/A5

UNIVERSITY MEMORANDUM

Sub : Sri Balaji Vidyapeeth – Ph.D Degree in Part – I Methodology Written Examination - February 2022 – Results Notified.

* * * * *

Mr/Mrs/Dr. **ANNALAKSHMI S,** UIN. **1905002019** Research Scholar in Nursing (Part Time - External) is declared to have passed the Ph.D Part-I – Methodology Examination held in February 2022 and he/she is permitted to continue the research under the guidance of Dr. **SUJATHA T** and submit the thesis for the award of Ph.D Degree as per the regulations of SBV.

Sl. No.	Subjects	Result Status
1	PAPER - I RESEARCH METHODOLOGY AND PROTOCOL	**PASS**
2	PAPER - II ON CHOSEN FIELD OF RESEARCH	**PASS**

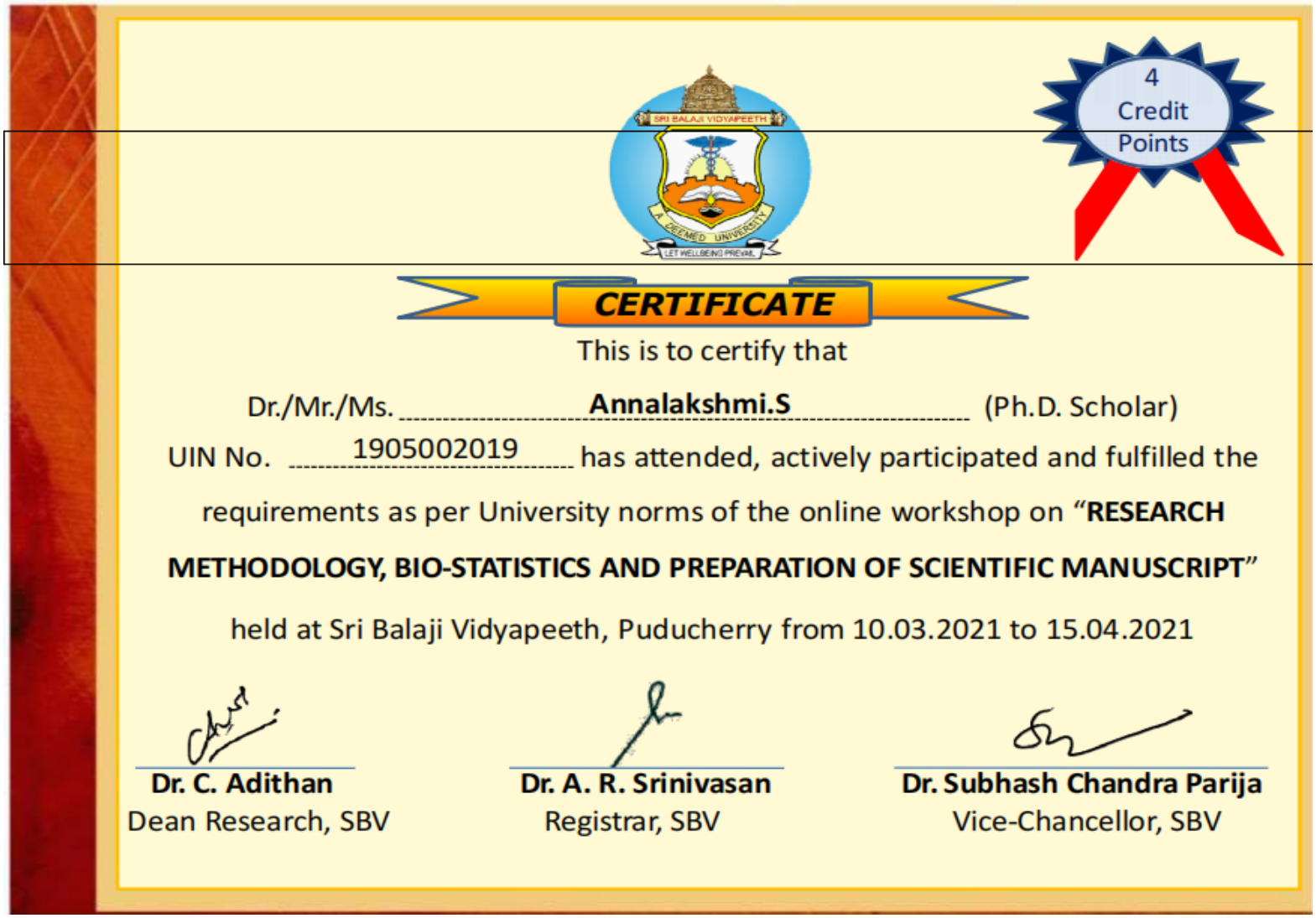
S. Sriranga raj

CONTROLLER OF EXAMINATIONS

To : Mr/Mrs/Dr. **ANNALAKSHMI S** through the Guide, SSSCON

Through : Dr. SUJATHA T, Prof. & HOD of Community Health Medicine, SSSCON

CC : The Guide.


SRI BALAJI VIDYAPEETH
DEEMED UNIVERSITY
LET WELLBEING PREVAIL
4
Credit
Points
CERTIFICATE
This is to certify that
Dr./Mr./Ms. Annalakshmi.S (Ph.D. Scholar)
UIN No. 1905002019 has attended, actively participated and fulfilled the
requirements as per University norms of the online workshop on "RESEARCH
METHODOLOGY, BIO-STATISTICS AND PREPARATION OF SCIENTIFIC MANUSCRIPT"
held at Sri Balaji Vidyapeeth, Puducherry from 10.03.2021 to 15.04.2021
Dr. C. Adithan
Dean Research, SBV
Dr. A. R. Srinivasan
Registrar, SBV
Dr. Subhash Chandra Parija
Vice-Chancellor, SBV

DHANVANTRI CRITICAL CARE CENTER

Dhanvantri Multispeciality Hospitals
(City Center)

INSTITUTION ETHICAL COMMITTEE

27-28, Poonkundranar Street, Karungalpalayam,
Erode - 638 003. Tamilnadu, India.
Phone : 0424 - 2211445, 2212445, 98427 08202 Fax : 0424 2224680
www.dhanvantrihospitals.com
contact@dhanvantrihospitals.com, dhanvantridiagnosis@gmail.com

APPROVAL OF ETHICS COMMITTEE

DCC/IEC/043/2021 Date : 08/11/2021

To

Guide

Dr. T. Sujatha, Ph.D., (N),
Professor & HOD,
Community Health Nursing,
Sri Sathya Sai College of Nursing,
Chengalpattu.

Name of the Scholar

Prof. Mrs. S. Annalakshmi,
Ph.D., Scholar,
Sri Balaji Vidyapeeth University,
Pondicherry.

STUDY TITLE : "EFFECTIVENESS OF ARBITRATION ACTIVITIES ON PHYSICAL AND BIOCHEMICAL INDICES AMONG THE ADOLESCENT GIRLS WITH ANEMIA IN A SELECTED RURAL COMMUNITY AT MADURAI.

Protocol No. : 036

Dear Madam,

We have reviewed the below listed documents,

Sr.No.	Document	Version No. & Date
01	Research Proposal	08/11/2021
02	Investigator CV	NA
03	Draft study materials of research proposal	NA

DHANVANTRI CRITICAL CARE CENTER

Dhanvantri Multispeciality Hospitals

(City Center)

INSTITUTION ETHICAL COMMITTEE

27-28, Poonkundranar Street, Karungalpalayam,
Erode - 638 003. Tamilnadu, India.
Phone : 0424 - 2211445, 2212445, 98427 08202 Fax : 0424 2224680
www.dhanvantrihospitals.com
contact@dhanvantrihospitals.com, dhanvantridiagnosis@gmail.com

The following members of the ethics committee were present at the meeting held between 10.00 am to 12.00 pm on 8th November 2021 at Institutional Ethics Committee – Dhanvantri Critical Care Center having its office at Dhanvantri Critical Care Center, No.27, Poonkundranar Street, Karungalpalayam, Erode - 638003, Tamilnadu.

S. No	Name of the IEC Member	Role in IEC	Opinion (Approve/ Disapprove)
1.	Dr. Rama .R, MBBS., M.D (Community Medicine)	Chair Person	Approved
2.	Dr. P. Padmavathi , M.Sc., (N), Ph.D., (N)	Member Secretary	Approved
3.	Dr. N. Ganapathy, MBBS., M.D (Anaesthesiology)	Clinician	Approved
4.	Dr. Gautham Ganapathy, MBBS (MD - Anesthesiology.)	Clinician	Approved
5.	Dr. Anuradha C Kamalarathnam, MBBS (MD - Obstetrics & Gynaecology)	Clinician	Approved
6.	Dr. Sivagami K, MBBS (MD- Pathology)	Basic Medical Scientist	Approved
7.	Dr. Siddeshwaran R, BA (MA,PhD-Sociology)	Social Scientist	Approved
8.	Mr. Sivasundaram P, BE (ME)	Lay Person	Absent
9.	Mr. Saravanan K T, B.A (LLB)	Legal Expert	Approved

We **approve/Disapprove/recommended for the revision of** the (protocol No.036) to be conducted in its presented form. The validity period of this approval is one year from the date of this letter.

8/11/2021

Member Secretary,
Institutional Ethics Committee,
Dhanvantri Critical Care Center,
27, Poonkundranar Street,
Karungalpalayam (Po)
Erode - 638 003.

CHAIRMAN/MEMBER SECRETARY
Institutional Ethics Committee,
Dhanvantri Critical Care Center.

Note : Institutional Ethics Committee – Dhanvantri Critical Care Center is Working in compliance with ICMR guidelines, ICH-GCP Guidelines, Schedule Y and applicable Local Laws. The Ethics committee is registered with DCGI with the registration number ECR/1206/Inst/TN/2019 under provision of rule 122dd of the Drug & Cosmetics Rules 1945.

The Institutional Ethics Committee – Dhanvantri Critical Care Center expects to be informed about the progress of the study, any SAE occurring in the course of the course of the study, any changes in the protocol and patient Information/Informed Consent and asks to be provided a copy of the summary report.

NPR GROUP OF INSTITUTION

Engineering & Technology (Autonomous) Arts & Science Nursing & Research Institute Allied Health Science
NPR Nagar, Natham – 624401, Dindigul Dist, Tamil Nadu, India. Ph; 04544 – 246500, 501. 502. www.nprcolleges.org

Certificate of Appreciation

This is to certify that Mr./Mrs./Dr. S. ANNALAKSHMI

has been a RESOURCE PERSON at the National Conference for World Anemia Day organised by Women Development Cell, NPR Group of Institution on 14-02-2025 and presented a paper EFFICTIVENESS OF BEHAVIOR CHANGE COMMUNICATION (BCC) ON PREVENTION AND MANAGEMENT OF ANAEMIA AMONG YOUNG GIRLS AT SELECTED COLLEGIES.

WDC President **WDC Co-Ordinator** **Organizing Secretary**

NPR
ARTS & SCIENCE COLLEGE

Approved by Government of Tamilnadu & Affiliated to Madurai Kamaraj University, Madurai.
Recognized by UGC under 2 [f] | Email: nprascoffice@nprcolleges.org | Web: www.nprcolleges.org
Natham - 624 401, Dindigul Dist, Tamil Nadu, Ph: 04544 - 246500, 501, 502

ISBN 9789361269585

Certificate of Appreciation

Two Day International Conference on

EVOLVING TECHNOLOGIES IN COMPUTING SCIENCE FOR MULTIDISCIPLINARY APPLICATIONS
ICETCSMA'25

This certificate is awarded to Prof/~~Dr/Mr/Mrs/Ms~~ S. ANNALAKSHMI.

from NPR COLLEGE OF NURSING & RESEARCH INSTITUTE for attending the International Conference on "Evolving Technologies in Computing Science for Multidisciplinary Applications" (ICETCSMA'25) and presenting a paper titled A DESCRIPTIVE CROSS SECTIONAL STUDY TO ASSESS THE PREVALENCE OF ANAEMIA AMONG THE COLLEGE STUDENTS, organized by the Departments of BCA, B.Sc(IT) and B.Sc (CS) in NPR Arts & Science College, Natham, Dindigul, Tamilnadu, on 7th & 8th January 2025.

Prof. G. VENKATESWARAN	Prof. N. GANESH KUMAR	Dr. S. BANU CHITRA	Dr. S. THABASU KANNAN
HoD/CS	HoD/IT	HoD/BCA	Principal
ORAGANIZING COORDINATOR	ORAGANIZING SECRETARY	CONVENOR	PATRON

Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 8
Open Access

A Descriptive Study To Assess The Risk Factors Of Anaemia Among The Young Girls In The Selected Colleges At Natham, Dindigul District

S. Annalakshmi[1*], Dr. T. Sujatha[2], Dr. T. Vijayapriya[3]

[1*]PhD Scholar, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, Principal- NPR College of Nursing & Research Institute, Natham, Dindigul District, Tamil Nadu

[2]Research Guide, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, Professor Cum HOD - Shri Sathya Sai College of Nursing, Chengalpattu, Tamil Nadu

[3]Research Co-Guide, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, Nursing Officer, Government Rajaji Medical College & Hospital. Madurai, Tamil Nadu

Cite this paper as: S. Annalakshmi, Dr. T. Sujatha, Dr. T. Vijayapriya (2024). A Descriptive Study To Assess The Risk Factors Of Anaemia Among The Young Girls In The Selected Colleges At Natham, Dindigul District. *Frontiers in Health Informatics*, *13 (8) 1953-1962*

INTRODUCTION

The burden of anemia is one of the major public health issues in the world. But the magnitude of problems is not equal in every country or for every group. In developing countries problem is enormous, specifically among women and young children whereas the developed countries are also affected but in lesser magnitude, approximately 6% as compared to 27% of adolescent girls in developing countries. Among the developing countries prevalence of anemia in South Asia is the highest in the world and India has a prevalence of high iron deficiency anemia. It was estimated that about 50 to 70 percent of reproductive women are anemic in India.

Anemia is adversely affecting women of reproductive age and child health which in turn results in increased morbidity and maternal death, and also hamper social-economic growth. The most common cause of anemia in the general population is iron deficiency. An estimate by the World Health Organization (WHO) that around to over half a billion women or 29.9% of reproductive women aged 15–49 years were suffering from anemia in 2019 and most of them suffer due to iron deficiency. Reproductive and adolescent women are more prone to anemia due to insufficient dietary intake and iron loss during menstruation and pregnancy.[1]

Globally, it is estimated that 40% of all children aged 6–59 months, 37% of pregnant women and 30% of women 15–49 years of age are affected by anaemia[2]

ABSTRACT

A Descriptive study was conducted to assess the risk factors of anaemia among the young girls in the selected colleges at Natham Dindigul District Tamilnadu. 200 adolescent girls who were studying in selected colleges were recruited by convenience sampling method. Risk factors of anemia assessed by using structured checklist devised by the investigator. Analysis revealed that 1% of young girls were having no-risk of anaemia, 72% of the young girls were having mild risk of developing anaemia, 27% were having moderate risk of anaemia and no one was having severe risk for anaemia. Also the demographic variables such as Age (in years), Birth Order, Total Number of family members, Educational status of the mother, Mothers occupation and Dietary Pattern were having significant association with the risk factors of anaemia.

STATEMENT OF THE STUDY

A descriptive study to assess the risk factors for anaemia among the young girls in the selected colleges at Natham Dindigul District Tamilnadu.

https://ojshostng.com/index.php/ajbr
Afr. J. Biomed. Res. Vol. 27(1s) (August 2024); 01- 13
Research Article

A Study To Assess The Effectiveness Of Video Assisted Teaching On Knowledge And Attitude Regarding Anaemia Among The Girls In The Selected Arts And Science College At Natham Dindigul District Tamilnadu

S. Annalakshmi[1*], Dr. T. Sujatha[2], Dr. T. Vijayapriya[3]

[1*]PhD Scholar, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, Principal- NPR College of Nursing & Research Institute, Natham, Dindigul District, Tamil Nadu
[2]Research Guide, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, Professor Cum HOD - Shri Sathya Sai College of Nursing, Chengalpattu, Tamil Nadu
[3]Research Co-Guide, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, Nursing Officer, Government Rajaji Medical College & Hospital. Madurai, Tamil Nadu

ABSTRACT

A pre-experimental study was conducted to assess the effectiveness of video assisted teaching on knowledge and attitude regarding anaemia among the girls in the selected arts and science college at Natham Dindigul District Tamilnadu. 50 college girls who were studying in arts and science group were recruited by convenience sampling method. After conducting pre-test level of knowledge by using questionnaire and attitude with Likert scale video assisted teaching was given for 1 hour regarding the causes, Risk factors, signs & symptoms, prevention and management. After 10 days of the intervention post test was conducted by using the same tools. Analysis revealed that video assisted teaching was effective to improve the knowledge and attitude among college girls

***Author for correspondence: Email:** :

Received: *Accepted:*

DOI: xyz

© 2024 The Author(s).
This article has been published under the terms of Creative Commons Attribution-Noncommercial 4.0 International License (CC BY-NC 4.0), which permits noncommercial unrestricted use, distribution, and reproduction in any medium, provided that the following statement is provided. "This article has been published in the African Journal of Biomedical Research"

INTRODUCTION

India is home to 253 million adolescents 10–19 years of age, among the largest cohorts globally. Limited nationally representative nutrition survey data exist for this age group. National Family Health Surveys (NFHS) cover only the 15- to 19-year age group and limited nutrition indicators. From 2005~2006 to 2019~2021, NFHS estimates indicate that anaemia prevalence among Indian adolescents aged 15~19 years has slightly increased (girls: 55.8% to 59.1%, boys: 30.2% to 31.1%) (International Institute for Population Sciences, 2022)[1]. So there is a tremendous need to increase the awareness regarding anaemia among the girls to bring out the healthy generation in the future.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of video assisted teaching on knowledge and attitude regarding anaemia among the girls in the selected arts and science college at Natham, Dindigul District Tamilnadu.

OBJECTIVES

- To assess the effectiveness of video assisted teaching on knowledge and attitude regarding anaemia among the college girls.
- To associate the level of knowledge and attitude with the selected demographic variables.

OPERATIONAL DEFINITION

Video assisted teaching

It's a planned teaching session for 1 hour by lecture along with the video regarding anaemia - Causes, Risk factors, Sign & Symptoms, Prevention and Management

Knowledge

Awareness, facts and information gained on anaemia through video assisted learning which is measured by structured questionnaire.

Attitude

It is a feeling or opinion about anaemia measured by 4 point Likert Scale